



EPA Region 7 TMDL Review

TMDL ID: NE2-L0090 **Waterbody ID:** NE2-L0090
Waterbody Name: IRON HORSE TRAIL LAKE
Tributary: Loes Branch (NE-12110)
Pollutant: NUTRIENTS AND SEDIMENT
State: NE **HUC:** 10240008
BASIN: Nemaha Basin
Submittal Date: December 13, 2005
Approved: yes

Submittal Letter

State submittal letter indicates final TMDL(s) for specific pollutant(s)/water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act.

In a letter received by EPA December 13, 2005 Nebraska officially submitted a TMDL for Iron Horse Trail Lake in response to impairments for nutrients and sediments.

Water Quality Standards Attainment

The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards.

The loading capacity is set for total phosphorus (TP) which is being used as the applicable pollutant to address the impairment for nutrients. A cause and effect relationship is made through the use of a lake response model, EUTROMOD. In the case of Iron Horse Trail Lake the model indicates the chlorophyll target will determine the allowable phosphorus load to the lake. The loading capacity for phosphorus is set at 2,379 pounds per year. This TMDL will result in a 76% reduction in phosphorus load. This should result in water quality attainment.

The sediment impairment listing is based on Iron Horse Trail Lake's >25 % volume loss of the multi-purpose pool and annual sedimentation rate exceeding 0.75%. The TMDL targets the narrative standard which will result in meeting the state's narrative criteria for the Aesthetics beneficial use found in Title 117, which states in part "To be aesthetically acceptable, waters shall be free from human induced pollution which causes floating, suspended, colloidal, or settleable materials that produce objectionable films, colors, turbidity, or deposits" (NDEQ 2002). Stakeholders also derived goals for sediment reduction. This goal will result in a 63.1% reduction in sediment loading and result in an annual lake volume loss of < 0.75%. This should result in water quality attainment.

Numeric Target(s)

Submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

Assigned beneficial uses are primary contact recreation, aquatic life warm water class A, Agricultural water supply class A and Aesthetics. Iron Horse Trail Lake was first listed as impaired in the Nebraska 1998 section 303(d) list because of nutrients. In Nebraska's 2004 Surface Water quality Integrated Report Iron Horse Trail Lake was listed as impaired for beneficial uses of Warmwater A (WWA), Aquatic Life, and Aesthetics. Pollutants of concern are nutrients and sediment. Regional water quality targets for total phosphorus and chlorophyll are 0.143 mg/L and 16 µg/L respectively and will apply to Iron Horse Trail Lake. These goals are more stringent than those derived by local stakeholders. These numeric targets are to be added as water quality criteria during the 2005 triennial review of Title 117, previously narrative criteria were targeted for nutrient impairments.

Nebraska does not have a numeric criterion for sediment. The TMDL targets the narrative criterion for the aesthetics use. Title 117 states "To be aesthetically acceptable, waters shall be free from human induced pollution which causes floating, suspended, colloidal or settleable materials that produce objectionable films, colors, turbidity or deposits." Local stakeholders defined a water quality goal which would result in attaining the narrative water quality standard.

Numeric Target(s) and Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety that do not exceed the load capacity.

Research has shown lakes in eastern Nebraska to be phosphorus limited. The nutrient target is direct; however, modeling was used to determine the load capacity for phosphorus that will also result in the targeted growing season mean chlorophyll concentration (16 ug/L). This will result in a phosphorus target of 103 ug/L concentration, or an annual load of 2,379 pounds.

The sediment target is directly related to the impairment. A 63% reduction in long term average annual loading will result in annual lake sedimentation rate of < 0.75 %. This reduction translates to a load capacity of 9,200 tons per year.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, non point and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered.

Four permitted animal feeding operation facilities in the watershed have been issued or requested state construction or operating permits or have requested inspections. Any permits issued in this watershed will be no discharge permits. Nonpoint sources of phosphorus include stream bank and gully erosion and phosphorus associated with varying land uses. Natural background sources were based on modeling results. This includes load from precipitation. It appears all major sources have been considered.

The present sediment load was derived from a bathymetric survey completed in 2001. This survey indicated an average of 24,966 tons per year was loaded to the lake. No point sources of sediment exist in the watershed. All sources are nonpoint and natural background. Natural sources are not separated from nonpoint sources in this TMDL. It appears all sources have been identified.

Allocation

Submittal identifies appropriate wasteload allocations for point, and load allocations for nonpoint sources. If no point sources are present the wasteload allocation is zero. If no nonpoint sources are present, the load allocation is zero.

The load capacity for phosphorus is set at 2,379 pounds per year. WLA, LA, and MOS are given. For sediment the load capacity is set at 9,200 tons per year.

WLA Comment

The four livestock facilities in the watershed are permitted and designed for zero discharge. The WLA for phosphorus is set at zero (0) pounds per year.

The WLA for sediment is set at zero (0) tons per year.

LA Comment

The load allocation from watershed nonpoint phosphorus sources is set at 2,352 pounds per year; the natural background is set at 27 pounds per year. The total LA is 2,379 pounds per year.

The load allocation for sediment is set at 9,200 tons per year.

Margin of Safety

Submittal describes explicit and/or implicit margin of safety for each pollutant. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided.

An implicit margin of safety is given for phosphorus. A conservative assumption is made that all phosphorus loaded to the lake will remain in the lake and none is exported through the outlet.

An implicit MOS is given in that losses through the outlet and deposition in the flood storage zone are not separated out from the calculations. Additionally, the watershed management plan should result in greater than a 63% reduction in load.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s).

The annual load is based on modeling the growing season but this nutrient TMDL applies throughout the entire year.

Sediment is assumed to have an infinite residence time so targets apply throughout the year.

Public Participation

Submittal describes public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s).

The availability of the TMDL was published in the Humboldt Standard and the Falls City Journal. The TMDL was also made available on the NDEQ web site and announcement letters were sent to stakeholders. The public comment period ran from October 10, 2005 to December 1, 2005. Minor errors were corrected from the public notice version of the TMDL.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies the monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used).

Monitoring will be done by the Nemaha Natural Resources District (NNRD) to determine the effectiveness of BMPs. The NNRD will also conduct monthly monitoring during the growing season and make that information available to NDEQ. NDEQ will also periodically evaluate the bathymetry of the lake.

Reasonable assurance

Reasonable assurance only applies when reductions in nonpoint source loading is required to meet the prescribed waste load allocations.

There are no point sources for phosphorus or sediment so reasonable assurances do not apply.